MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2017/2018

BER2094 – ENVIRONMENTAL & RESOURCE ECONOMICS

(All Sections/Groups)

31 MAY 2018
2.30 p.m - 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **SIX (6)** pages including cover page with Section A and B.
2. Section A consists of **ONE (1)** Case Study. Section B consists of **THREE (3)** Structured Questions.
3. Attempt **ALL** questions.
4. Please write all the answers in the answer booklet provided.
5. The marks distribution for each question is given. Total marks is 100.

SECTION A: CASE STUDY (40%)

What a waste: Malaysia's struggle with excess food

By: Sunnisha Naidu
18 Apr 2017 03:11PM (Updated: 15 Jun 2017 10:10AM)

Food wastage is a growing problem in Malaysia, where authorities and non-governmental organisations are working to address the issue.

KUALA LUMPUR: The 88-storey Petronas Twin Towers are among the tallest buildings in the world, looming over Kuala Lumpur at 1,483 feet. Now, imagine if both those towers were filled to the brim with food. That is the amount of avoidable food waste generated by Malaysians in just 18 days.

According to SWCorp Malaysia, a government agency dealing with solid waste, Malaysians generate about 38,000 tonnes of waste per day. Around 15,000 tonnes of this is food waste. "About 8000 tonnes, nearly 60 per cent of waste that is being generated, is avoidable food waste," Mohd Pauze Mohamed Taha, Deputy CEO (Technical) SWCorp, told Channel NewsAsia. "Meaning that if there was proper management, proper consideration in our handling of resources, this amount of waste could be reduced," Dr Mohd Pauze said. Out of this 8,000 tonnes, 3,000 tonnes of food going to landfills daily is edible – food that could have fed around two million people. These are troubling figures to SWCorp, even by international standards. The United Nation's Food and Agriculture Organisation estimates 1.3 billion tonnes of food is lost or wasted globally a year.

Multi-ethnic Malaysia prides itself on being a food haven. Food is inextricably linked to its identity, with every tourism campaign boasting the diverse dishes the Southeast Asian nation has to offer – from traditional Malay *nasi lemak* to Indian banana leaf rice. Food is also tied to Malaysians expectations of hospitality. You would be hard pressed to attend any function without a spread of dishes on offer.

Not surprising then that SWCorp found that food waste can increase by up to 50 per cent during the festive periods. All this can contribute to Malaysians' ignorance about the problems the nation is grappling with, according to Hayati Ismail, director of the Food Aid Foundation. "In Malaysia, we have an abundance of food - we see food everywhere - everywhere we go we expect a big feast," she said. "So it does not click in our mind that there are people who aren't eating.

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"Here we are listening to stats that obesity rates are very high. At the same time, undernourishment is also an issue. So when there's (3000 tonnes of wasted edible food), there should not be undernourishment in this country." Hayati's Food Aid Foundation works to salvage and redistribute food that would have otherwise been thrown away. It collects unserved dishes from hotels, breads and canned food from hypermarkets and more to distribute to charities and soup kitchens. "The number one source of food waste is domestic waste, from the household," said Hayati. "Second is the pasar malam (night markets) and Ramadan bazaars. Third is waste from the food courts, then comes the food and beverage sector." She added: "But we also have to look at the food manufacturers. When there are six months left on the expiry date, they have to pull the products from the shelf ... and what happens to the food? It goes to the landfill."

The Food Aid Foundation tries to salvage these products – sometimes "reengineering" them for the people who rely on them for meals. If they collect 500 cans of baked beans, for example, this may be too much to serve at once. So a portion is cooked – with onions and sausages contributed from donors – frozen and served at a later date. The meals are very much in demand, especially among the urban poor – a rising problem, according to Hayati. "When I started volunteering at soup kitchens in 2014, there were only 180 people in a line. But now there are 600 more people queuing up for food – and they're not all homeless. "So of all the food we have, this is where the food should go to."

FOOD WASTELAND

The reality, however, is the food is still ending up in Malaysia's landfills – and space is running out. As of 2016, Malaysia had 170 waste disposal sites – and only 14 had "sanitary landfill" status. "When the amount of waste increases, the cost of managing it increases and at the same time we have to provide space in landfills," said Dr Mohd Pauze. "When this food goes to the landfill, it will decompose and disintegrate too, emitting greenhouse gases like methane, which has a severe impact on climate change and also global warming." Some state governments have introduced waste segregation laws to help manage this – although compliance has been a problem. SWCorp said it is also building anaerobic digesters for food courts in certain states as well as composting facilities. The government has also rolled out a MYSaveFood programme – partnering with the likes of FAO and SWCorp – to educate and encourage Malaysians on food wastage.

Food wastage videos have been widely shared on social media – and advocates can see that these campaigns and greater media attention are slowly achieving its purpose. "The reception was lukewarm at the beginning, but since last year, people are more aware especially with (organisations like) SWCorp shouting out that of the 15,000 tonnes of food ending up in the landfill, 3000 tonnes are edible," said Hayati.

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WHAT CAN BE DONE?

Given the number one source of food waste in Malaysia is domestic, Hayati believes Malaysians have to start at home. "Make a list, plan a weekly menu," she said. Simple steps can be taken to salvage leftover food at home as well. For instance, vegetables can be removed from leftover chicken curry before it is frozen. The curry can be reheated at a later date with fresh vegetables – as opposed to throwing the whole lot out. Planning your meals can be a cost saver too. SWCorp estimates RM2,700 (US$612) worth of food per year is wasted in an average household of five people.

For buffet lovers – and there are many in Malaysia, especially during the Muslim fasting month – try to minimise the amount of food you put on your plate. "I'm not against buffets, but how they are served, needs to be properly managed too," said Dr Mohd Pauze. "Food if not touched, can actually be saved."

To that end, Hayati is encouraging more hotels to contribute leftover food – although due to a lack of Good Samaritan laws in Malaysia, many hesitate, fearing they will be held liable should the food not be safe to eat. However, Hayati gets around this by getting all donors to sign an indemnity form. Her team stringently checks all donated food before serving them as well. Extra food can also go to helping the thousands of stray animals in Malaysia.

"It will help many shelters to save some money," said Edward Lim, shelter manager at PAWS Animal Welfare Society. "Whatever human can eat, dogs can too."

Source: https://www.channelnewsasia.com/news/asia/what-a-waste-malaysia-s-struggle-with-excess-food-8735458

Based on the above article, answer the following questions:

a) Based on your understanding, explain the stages of waste stream in Malaysia. (5 marks)

b) *The 88-storey Petronas Twin Towers are among the tallest buildings in the world, looming over Kuala Lumpur at 1,483 feet. Now, imagine if both towers were filled to the brim with food. That is the amount of avoidable food waste generated by Malaysians in just 18 days.*
List the **THREE (3)** major sources of food waste in Malaysia.
(6 marks)

c) *As of 2016, Malaysia had 170 waste disposal sites – and only 14 had "sanitary landfill" status. "When the amount of waste increases, the cost of managing it increases and at the same time we have to provide space in landfills," said Dr Mohd Pauze.*
Distinguish between open landfill and sanitary landfill. (6 marks)

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d) Discuss any **THREE (3)** approaches suggested by the article to reduce food waste in Malaysia (12 marks)

e) As an environmental economist, suggest a market-based instrument that may be adopted by the government to reduce food wastes in the country. Discuss with the aid of a diagram. (11 marks)

SECTION B: STRUCTURED QUESTIONS (60%)

QUESTION 1 (20 marks)

a) Show graphically and explain the Materials Balance Model. (10 marks)

b) Using risk-benefit analysis, critically evaluate the effect of the banning of non-hybrid and non-electric automobiles for firms, government and the public in Malaysia. (10 marks)

QUESTION 2 (20 marks)

a) Logging is a controversial economic activity due to its environmental impacts. Explain any **FOUR (4)** environmental consequences of logging in Malaysia. (10 marks)

b) List and explain the **FOUR (4)** key components of Life Cycle Assessment (LCA). (10 marks)

QUESTION 3 (20 marks)

a) Refer to the following benefit and cost functions for lead abatement (A):

$MSB = 35 - 0.3A$ $MSC = 21 + 0.2A$

$TSB = 30A - 0.25A^2$ $TSC = 16A + 0.2A^2$

Where, A is the percentage of lead abatement and ringgit values are in millions.

i) If the lead abatement level was set at 10 percent, determine whether the net benefits are positive or negative? (5 marks)

ii) Should the control on lead be tightened or relaxed in order to achieve allocative efficiency? Support your answer with calculations. (5 marks)

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b) Malaysia plans to implement an excise tax on fuel consumption. The following are the supply and demand functions for the carbon dioxide (CO_2) market in the country before the excise tax is imposed, where P is price per litre.

Supply: $Q = 12.00 + 3.5P$ Demand: $Q = 16.00 - 0.5P$

Assume that if 70 cent of excise tax is used, the supply curve will shift to $Q' = 10.00 + 3.5P$.

i) Calculate the equilibrium price before and after the excise tax is implemented. (4 marks)

ii) Based on the answer from (i), who will suffer higher tax burden, buyers or sellers? Explain. (6 marks)

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